NOTE XX.

ON A BHAWANIA-SPECIMEN, A CONTRIBUTION TO OUR KNOWLEDGE OF THE CHRYSOPETALIDAE

BY

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(With plate 9).

Amidst sponges, recently collected by my friend Mr. P. J. Buitendijk in the bay of Batavia, I met with a Polychaete-worm, obviously belonging to the genus *Bhawania* of Schmarda [1]). Though I cannot give full information about its structure, because I had only a single specimen at my disposal with its head so far withdrawn that it was quite invisible, nevertheless I think the present communication not without interest, since Schmarda's description is rather incomplete and there still reigns a good deal of uncertainty about the affinity of the paleae-bearing Polychaetae.

It is a slender, flattened worm, measuring 25 mm. in length and $1^1/_2$ mm. in breadth; the body is only slightly tapering at its anal extremity and has about 175 segments. Its colour is yellowish gray with a somewhat paler dorsal border and a median row of black spots at the ventral side; moreover there is a couple of black patches at the base of each foot, forming along the sides of the body a narrow dark band. The dorsum is entirely covered by the paleae (fig. 1), which are arranged in slightly bent transverse rows, with the concavity directed forward; this concavity increases towards the head and on the anterior segments

1) Neue Wirbellose-Thiere, Bd. I, 2, 1861, p. 164, pl. 37, figs. 323—325.

the rows nearly have the shape of a circle. Each row consists of a left and a right half, each containing in the middle of the body 20 paleae; the median ones of both sides are partly stretching over each other in the middle of the back. The paleae differ somewhat in size in different regions of the body, and in the same row the lateral ones are the longest and extend a little beyond the others. As rightly stated by Ehlers [1]) these paleae show a great resemblance with the scales of the butterfly-wing; they consist (figs. 2 and 3) of a shaft, entirely hidden in the dorsum, and a broad distal division. The shaft, measuring about a third of the total length of the bristle, is faintly knee-like bent and becomes somewhat broader in its upper beneath the cuticula lying portion.

The distal portion of the bristle has an elongated spoon-like shape, with an arched surface, its convex side being turned upward; its margin is plain, except at its median side, that is bluntly serrated. Both sides of the palea do not have the same structure. Its convex side (fig. 2) shows three strong, longitudinal ridges, one in the middle and one on both lateral area's; the spaces between these ridges are densely beset with small round tubercles, that assume a more transverse shape towards the distal end of the bristle. The concave side of the palea (fig. 3) possesses 14 to 15 delicate, longitudinal veins, the median ones of which are prolongating into the shaft; the area's between these veins show a fine transverse striation, like as observed in the shaft of most compound bristles. The paleae have a yellowish hue (by transmitted light) except at the tip, which is colourless; in some of them I observed moreover 6 to 7 pale narrow, transverse bands, dividing the total surface in as much transverse fields. The distal portion of a palea measures about 0.25 mm. in length and 0.08 mm. in breadth.

The paleae of *Bhawania* are much agreeing with those

1) Die Borstenwürmer, p. 84.

of *Chrysopetalum* [1]), however in these worms the total margin of the bristle is serrated and there occur only 5 longitudinal ridges on its dilated portion. The paleae of *Paleanotus* [2]) too, as far as can be concluded from Schmarda's incomplete figures, have a similar appearance; on the contrary the long paleae (»spinose dorsal bristles" Mc. Intosh) of *Palmyra* [3]) differ considerably and have a quite other feature.

Outward from the row of paleae and separated from it by the dorsal cirrus, the notopodium bears a fascicle of elongated, spatulate bristles with a pointed tip and a short shaft (fig. 4); they show the same fine transverse striation as the underside of the paleae, but it is usually masked by foreign matters adhering to them. A yellow, faintly bent acicula occurs at the base of this fascicle. *Chrysopetalum* appears to lack this dorsal fascicle; however in *Paleanotus* it is probably present (Schmarda, loc. cit. p. 163).

The neuropodium contains a fascicle of compound bristles, much resembling those of *Nereis* (fig. 5). The stalk has at its distal extremity a forked cup, much higher at one side than at the other, in which a falcate appendix is articulated, that ordinarily is provided with hairs along its concave border; in some of them this terminal piece is twice as long as in others. Moreover in the dorsal portion of the ventral fascicle there occurs a couple of setose bristles (fig. 6), the distal region of which is also furnished with fine hairs along its margin. This fascicle is likewise supported by a yellow acicula. In *Chrysopetalum* as well as in *Paleanotus* the ventral fascicle contains also compound bristles; *Palmyra* on the contrary has simple, forked ventral bristles.

All segments of *Bhawania* are provided with a dorsal cirrus, situated outward from the row of paleae and almost as long as these; it consists of a cylindrical basal

1) Ehlers, loc. cit. pl. II, fig. 5.
2) Schmarda, loc. cit. p. 163, fig. e and pl. 37, fig. 329.
3) Mc. Intosh, Challenger Annelida, pl. VIA, fig. 8.

segment and a tapering distal part, nearly of the same length. This terminal portion is provided on its surface with small tubercles and shows in its basal region several strongly refringent glands. The ventral cirrus likewise is articulated, but it has a short conical basal segment; its distal part is dilated at the base and contains also numerous glands. A pair of slender anal cirri are present, extending somewhat beyond the posterior segment.

Whether our Batavia-worm is specifically distinct from the *Bhawania myrialepis* of Schmarda, from Ceylon, is not easy to decide. The dimensions of the last-named species are much greater, its length being 63 mm. and its breadth 4 mm., whereas the number of segments amounts to 220; the paleae are of a gold-colour mixed with red, and the belly is reddish brown. Regarding the head Schmarda states: it is small, provided with five antennae of the same length and wants the eyes; but I have some doubt, that his description as well as his figure is not exact, perhaps because he could not clearly distinguish it, like as in our specimen. On the contrary the cephalic lobe of *Paleanotus* agrees with that of *Chrysopetalum* in the presence of 3 antennae and 2 pairs of eyes.

For a longtime there reigned a good deal of uncertainty about the real characters and the systematical position of *Palmyra*, because, as rightly stated by Racovitza [1]), the descriptions of the different authors were very divergent and discrepant. By the investigations of Grube [2]) and Mc. Intosh we now have a better knowledge of the structure of *Palmyra aurifera* and it is proved by these authors that *Palmyra* is distinguished from *Chrysopetalum* and *Paleanotus* (and *Bhawania*?) not only by another structure of the head (stalked eyes, a single unpaired antenna) and by the parapodia having simple ventral bristles, but also by

1) Le lobe céphalique et l'Encéphale des Annél. Polychètes: Archiv. Zool. expérim. 3e Sér. t. IV, 1896, p. 209.

2) Annulata Semperiana: Mém. Acad. Imp. d. Sc. St. Pétersbourg, Sér. 7, t. XXV, p. 13.

the presence of scales [1]). Mc. Intosh has been the first, who demonstrated that *Palmyra* possesses smooth, diaphanous scales, that were overlooked by Savigny, by Audouin and Milne Edwards and by Grube. Considering that *Palmyra* moreover agrees with *Pontogenia* in the appendages of the head (stalked eyes, unpaired antenna), in the shape of the ventral bristles and of the cirri with their slender terminal part, then in my opinion there can nomore remain any doubt, that *Palmyra* belongs to the Aphroditidae, as supposed by Savigny, and cannot be united with *Chrysopetalum*, *Paleanotus* and *Bhawania* in the same family. Therefore the family of the Palmyridae cannot longer be maintained and, as already suggested by Ehlers, it is desirable to use instead of that the name of Chrysopetalidae.

This family may then be characterized as follows:

Body short or elongated, with few or numerous segments, all bearing on their dorsal side a fan or a transverse row of paleae. Cephalic lobe provided with tentacles and eyes [2]). Buccal segment with two or four tentacular cirri on each side. Parapodia uniramous or biramous, with dorsal cirri upon all segments. Compound ventral bristles.

A. Body short, with few segments. Parapodia uniramous.

a. Buccal segment with 4 tentacular cirri on each side. Paleae arranged in a fan.

CHRYSOPETALUM Ehlers.

Chrys. debile (Gr.) [3]).

(*Palmyra debilis* Gr.; *Chrys. fragile* Ehl.; *Palm. portus-veneris* Clap.; *Palm. Evelinae* Clap.; *Chrys. coecum* Langh.).

Mediterr. (Nice, Porte-Vendres); Adriat. (Quarnero); Madeira.

1) About the distribution of the dorsal cirri there still reigns some uncertainty; whereas Grube says that they appear alternately as with the Aphroditidae, according to Mc. Intosh „they occur both on feet provided with scales and on those without them."

2) I suppose that the palps in *Paleanotus* have been overlooked by Schmarda.

3) For the details of the literature see Ehlers and Racovitza loc. cit.

b. Buccal segment with 2 tentacular cirri on each side. Paleae in a transverse row.

PALEANOTUS Schmarda.

Pal. chrysolepis Schm. . . . . Cape of Good Hope.

B. Body elongated, with numerous segments. Parapodia biramous. Paleae in a transverse row.

BHAWANIA Schmarda.

Bhaw. myrialepis Schm. . . . . Ceylon, Trincomali.

Bhaw. sp. . . . . Bay of Batavia.

Perhaps the genus *Dysponetus* of Levinsen (Vidensk. Meddel. f. d. naturh. Forening i Kjøbenhavn, 1879), as suggested by Racovitza, is nearly allied to this family.

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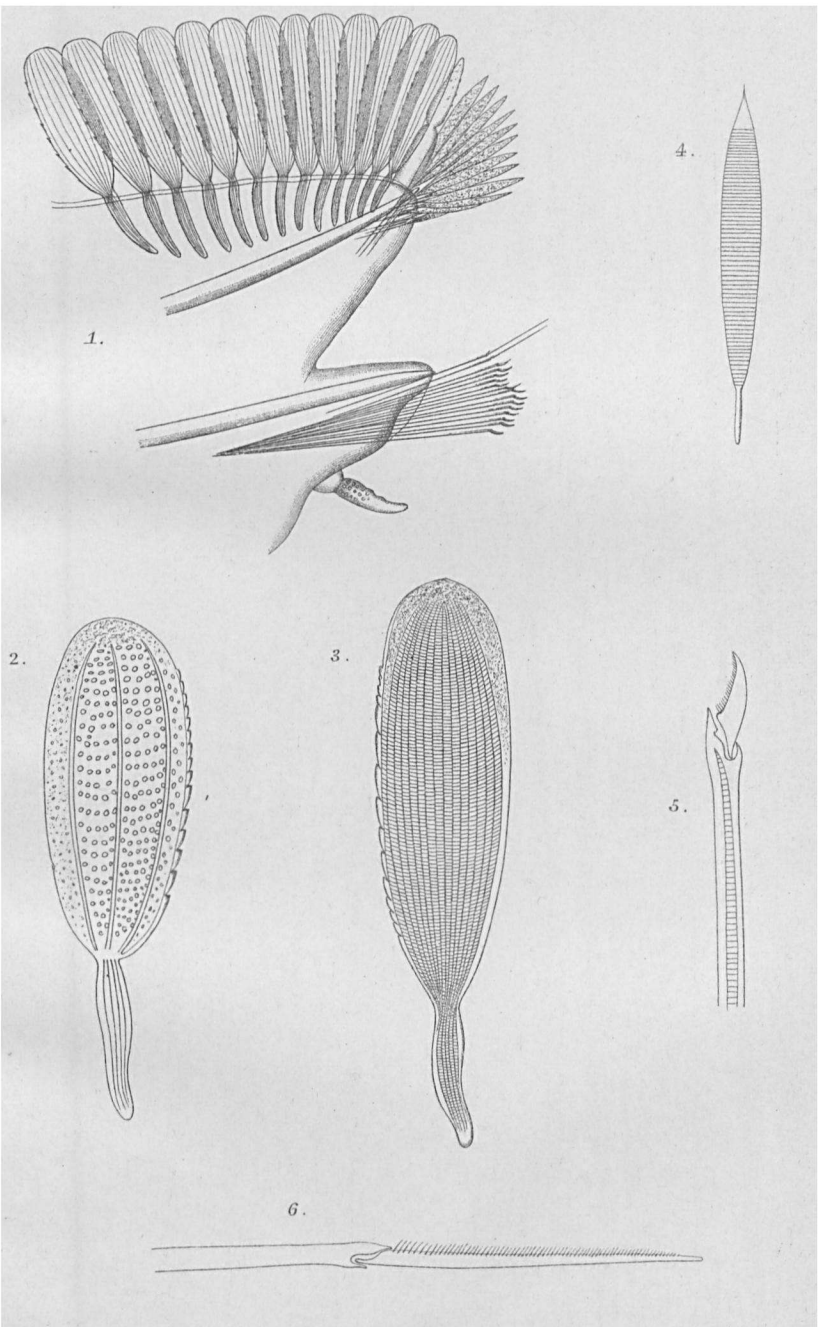
EXPLANATION OF THE PLATE.

Fig. 1. A parapodium of the middle of the body. × 110 diam.
" 2. A palea seen from the upperside. × 330 diam.
" 3. An other palea seen from the underside. × 230 diam.
" 4. A spatulate dorsal bristle. × 330 diam.
" 5. A ventral falcate bristle. × 330 diam.
" 6. A ventral setose bristle. × 600 diam.



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Bhawania spec.